

SYSTEM DESCRIPTION

1. POWER WINDOW CONTROL SYSTEM DESCRIPTION

- (a) The power window control system controls the power window UP/DOWN function by using regulator motors. This system is mainly controlled by the multiplex network master switch built into the driver's door and multiplex network switches built into passenger's doors. Pressing any of these multiplex network switches or the driver side door window switch mounted on the master switch transmits an UP/DOWN signal to the regulator motor for the corresponding power window, which then operates the power window UP/DOWN. Pressing any switch for the power windows except the driver's power window mounted on the master switch transmits a remote UP/DOWN signal to the body ECU via the BEAN line. Then the body ECU transmits this remote signal to the regulator switch for the corresponding power window via the BEAN line and activates the motor to open/close the power window.
- (b) The power window control system has the following functions:

Function	Outline
Manual up-and-down function	Function that causes window to go up while power window switch is being pulled halfway up and to go down while pushed halfway down. Window stops as soon as the switch is released.
All door auto up-and-down function	Function that enables window of all doors to be fully opened or closed by one press of power window switch.
Jam protection function	Function that automatically stops power window and moves it downward if a foreign object gets jammed in door window during auto-up operation.
Remote control function	Function that allows power window master switch to control AUTO and MANUAL up-and-down operations of front passenger door window and rear door windows.
Key-off operation function	Function that makes it possible to operate power window for approx. 45 seconds after ignition switch is turned to ACC or LOCK position, if either front door is not opened.
Key-linked up-and-down function	Function that causes window to go up while driver's door key is turned to lock side for more than 1.5 seconds and to go down while turned to unlock side for more than 1.5 seconds. Window stops as soon as the key is returned to original position.
Transmitter-linked down function	Function that causes window to go down while unlock switch on transmitter is pressed for more than 2.5 seconds. Window stops as soon as the switch is released.
Diagnosis	Function that allows the power window switch to make a diagnosis for failed section when power window switch detects a malfunction in power window system. Power window switch light comes on or blinks to inform driver.
Fail-safe	A fail-safe function to disable a part of power window functions if pulse sensor in power window motor has a malfunction: <ul style="list-style-type: none"> • All door auto up-and-down function and remote control function are disabled. • Manual operation is possible by each power window switch.

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use this procedure to troubleshoot the power window control system.
- The intelligent tester should be used in steps 3 and 5.

1 VEHICLE BROUGHT TO WORKSHOP

NEXT

2 CUSTOMER PROBLEM ANALYSIS CHECK AND SYMPTOM CHECK

NEXT

3 CHECK COMMUNICATION FUNCTION OF MULTIPLEX COMMUNICATION SYSTEM (BEAN)

HINT:

See page [MP-6](#)

- (a) Use the intelligent tester to confirm normal function of the multiplex communication system.
- (1) (ECU unconnected, communication line malfunctioning) Without code outputs, proceed to A.
 - (2) (ECU unconnected, communication line malfunctioning) With code outputs, proceed to B.

B

Go to **MULTIPLEX COMMUNICATION SYSTEM**

A

4 PROBLEM SYMPTOMS TABLE

HINT:

See page [WS-13](#)

NEXT

5 OVERALL ANALYSIS AND TROUBLESHOOTING

- (a) Data list/Active test

HINT:

See page [WS-22](#)

- (b) Circuit inspection

- (c) Terminal of ECU

HINT:

See page [WS-14](#)

NEXT

6 ADJUST, REPAIR OR REPLACE

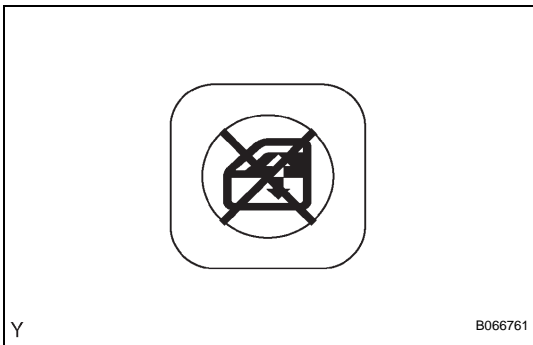
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7 RESET POWER WINDOW MOTOR

HINT:
See page [WS-12](#)

NEXT

END



OPERATION CHECK

1. CHECK WINDOW LOCK SWITCH

- (a) Check that the front passenger side power window and rear power window operation is disabled when the window lock switch of the power window master switch is pressed.

standard:

Front passenger side power window and rear power window operation is disabled.

- (b) Check that the front passenger side power window and rear power windows can be operated when the window lock switch is pressed again.

standard:

Front passenger side power window and rear power windows can be operated.

2. CHECK MANUAL UP/DOWN FUNCTION

- (a) Check that the driver side power window operates as follows:

Standard

Condition	Master Switch	Switch Operation	Power Window
Ignition switch ON	Driver side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

- (b) Check that the power windows except the driver side power window operates as follows:

Standard

Condition	Master Switch	Switch Operation	Power Window
<ul style="list-style-type: none"> • Ignition switch ON • Window lock switch OFF 	Passenger side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear LH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear RH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

3. CHECK AUTO UP/DOWN FUNCTION

- (a) Check that the driver side power window operates as follows:

Standard

Condition	Master Switch	Switch Operation	Power Window
Ignition switch ON	Driver side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

- (b) Check that the power windows except the driver side power window operate as follows:

Standard

Condition	Master Switch	Switch Operation	Power Window
<ul style="list-style-type: none"> Ignition switch ON Window lock switch OFF 	Passenger side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear LH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear RH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

4. CHECK REMOTE MANUAL UP/DOWN FUNCTION

- (a) Check that the power windows except the driver side power window operate as follows:

Standard

Condition	Master Switch	Switch Operation	Power Window
<ul style="list-style-type: none"> Ignition switch ON Window lock switch OFF 	Passenger side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear LH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear RH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

5. CHECK REMOTE AUTO UP/DOWN FUNCTION

- (a) Check that the power windows except the driver side power window operate as follows:

Standard

Condition	Master Switch	Switch Operation	Power Window
<ul style="list-style-type: none"> Ignition switch ON Window lock switch OFF 	Passenger side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear LH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear RH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

6. MANUAL UP/DOWN FUNCTION USING DRIVER SIDE DOOR LOCK KEY CYLINDER

- (a) Check that all power windows and sliding roof (standard type only) operate as follows, when the key is inserted into the driver side door lock key cylinder:

Standard

Condition	Key Operation	Position/Operation
No key in ignition key cylinder	Turned left (LOCK) for more than 1.5 sec.	Driver and passenger side power windows/UP
	Turned left (LOCK) for more than 2.0 sec.	Rear LH and RH power windows/UP
	Turned left (LOCK) for more than 2.5 sec.	Sliding roof/CLOSE
	Turned right (UNLOCK) for more than 1.5 sec.	Driver and passenger side power windows/DOWN
	Turned right (UNLOCK) for more than 2.0 sec.	Rear LH and RH power windows/DOWN
	Turned right (UNLOCK) for more than 2.5 sec.	Sliding roof/OPEN

7. CHECK MANUAL DOWN FUNCTION USING TRANSMITTER

- (a) Check that all power windows and sliding roof (standard type only) operate as follows when operating the transmitter:

Standard

Condition	Transmitter Operation	Position/Operation
<ul style="list-style-type: none"> • No key in ignition key cylinder • Any door unlocked 	UNLOCK switch pressed for more than 1.5 sec.	Driver and passenger side power windows/DOWN
	UNLOCK switch pressed for more than 2.0 sec.	Rear LH and RH power windows/DOWN
	UNLOCK switch pressed for more than 2.5 sec.	Sliding roof/OPEN

HINT:

For a sign for starting operation, the wireless door lock buzzer sounds once (answer-back).

8. CHECK POWER WINDOW OPERATION FUNCTION AFTER IGNITION SWITCH IS TURNED OFF

- (a) When both of the following conditions are fulfilled, check that the power windows can be operated even after the ignition switch is turned off.
 - (1) Within 45 seconds after the ignition switch is turned off.
 - (2) The front doors are closed.

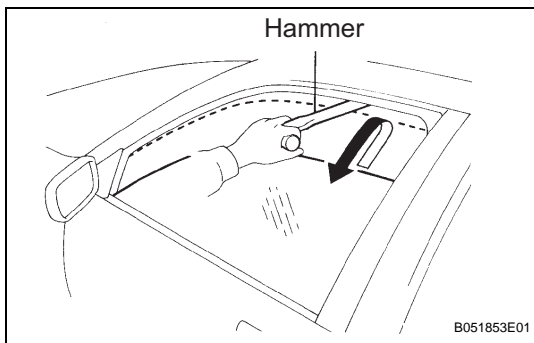
9. CHECK JAM PROTECTION FUNCTION

HINT:

The jam protection function prevents any part of your body from getting caught by accident between the door frame and the door glass during power window operation.

NOTICE:

If the power window motor has been reset, raise and lower the door glass several times using MANUAL function before performing the check.



- (a) Check that the door glass goes down by approx. 50 mm (1.97 in.) right when something gets caught between the door frame and door glass during power window operation. However, when the opening between the door frame and the door glass is less than 200 mm (7.87 in.), the door glass continues to go down and does not stop until an opening of 200 mm (7.87 in.) is achieved. Operative conditions:
- AUTO UP
 - AUTO UP function after the ignition switch is turned off
 - MANUAL UP function after the ignition switch is turned off
 - MANUAL UP function using the driver side door lock key cylinder